

CLAIMS:

1. Scintillator (20) for an X-ray detector, comprising
 - a scintillation layer (30) for the conversion of X-rays (X) into optical photons (v);
 - a reflector (40, 140) disposed near at least one surface of the scintillation layer (30) for reflecting optical photons (v) back into the scintillation layer, wherein the reflectivity of the reflector can be altered;
 - a control device (50) for selectively altering the reflectivity of the reflector (40, 140).
2. Scintillator according to claim 1, characterised in that the reflector and the control device are adapted to alter the reflectivity locally different.
- 10 3. Scintillator (20) according to claim 1, characterised in that the reflector (40, 140) and the control device (50) are adapted to alter the reflectivity gradually.
- 15 4. Scintillator according to claim 3, characterised in that the gradual alteration of the reflectivity is approximated by discontinuous changes of the reflectivity on a high resolution scale.
- 20 5. Scintillator (20) according to claim 1, characterised in that the reflector (40) comprises two planar electrode arrangements (44a, 44b) between which a reflective layer (41, 42, 43) consisting of electronic ink or an absorbing layer with voltage and/or current dependent absorption properties is disposed.
- 25 6. Scintillator according to claim 5, characterised in that at least one of the electrode arrangements consists of several single electrodes which can be selectively controlled.

7. Scintillator according to claim 5, characterised in that one of the planar electrode arrangements has a high reflectivity in the direction towards said absorbing layer.

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8. Scintillator according to claim 5, characterised in that the absorbing layer comprises an electrochromic substance and/or suspended particles that change their arrangement in response to the voltage applied to the electrode arrangements.

10 9. Scintillator according to claim 1, characterised in that the reflector (140) comprises a container (143) that may selectively be filled with substances (142, 145) of different reflection properties and/or absorption properties.

15 10. Scintillator according to claim 1, characterised in that the reflector comprises a substance that alters its reflection properties and/or absorption properties in response to chemical and/or electrochemical influences.

20 11. X-ray detector with an array of sensor elements (12) for the spatially resolved detection of optical photons (ν) and with a scintillator (20) arranged adjacent to said array, wherein the scintillator (20) comprises: a scintillation layer (30) for the conversion of X-rays (X) into optical photons (ν) and means (40, 50, 140) for changing the degree to which optical photons (ν) are reflected back into the scintillation layer (30) on at least a part of the surface of the scintillation layer (30).

12. Method for the spatially resolved detection of X-rays (X), comprising:

- a) conversion of X-rays (X) into optical photons (v) in a scintillation layer (30);
- b) detection of photons (v) out of the scintillation layer (30) that reach a photosensitive detector (10); c) reflecting photons (v) back into the scintillation layer (30) that would
5 not reach said detector (10); d) adapting the reflectivity in step c) according to given criteria like the desired sensitivity, spatial resolution and/or dynamic range of the method.

13. X-ray detection apparatus that comprises an X-ray detector according to
10 claim 11 or a scintillation layer according to any one of claims 1 – 10.